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Dr. H. G. Bronn's Klassen und Ordnungen des Thier-Reichs, Wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von Dr. A. Gerstaecker, Professor an der Universität zu Greifswald, Mit auf Stein gezeichneten Abbildungen. Fünfter Band, II Abtheilung. Gliederfüssler: Arthropoda 1, 2, und 3 Lieferung. Roy. 8vo, pp. 96, 8 plates. Leipzig und Heidelberg, 1881. From the editor.

Dr. H. G. Bronn's Klassen und Ordnungen des Thier-Reichs, Wissenschaftlich dargestellt in Wort und Bild. Fortgesetzt von C. K. Hoffmann, Doctor der Medicin und Philosophie, Professor in Leiden. Mit auf Stein gezeichneten Abbildungen. Sechster Band. III Abtheilung. Reptilien 18, 19, 20 und 21, Lieferung. Roy. 8vo, pp. 127, 8 plates. Leipzig und Heidelberg, 1881. From the editor.

Bulletins de la Société d'Anthropologie de Paris, Tome Troisième (III série), ze Fasciciule Avril à Juillet, 1880. 8vo, pp. 159. Paris, 1880. From the society.

Société Malacologique de Belgique Procès-Verbal de la Séance du 3 Avril, 1880. Séance du 2 Octobre, 1880. 8vo, pp. 50. 1881. From the society.

Sur l'Arc Pelvien chez des Dinosauriens de Bernissart. Par M. G.-A. Boulenger. Rapport de M. P.-J. Van Beneden. 8vo, pp. 8. Brussels, 1881. From the author.

De la Nomenclatur des Étres Organises Société Zoologique de France. Au siege de la Société. 8vo, pp. 38. Paris, 1881. From the society.

Bulletin de la Société Zoologique de France pour L'année 1881. 1re & 2e Porties Séances de Janvier–Avril. 8vo, pp. 80, 1 plate. Paris, 1881. From the society.

Note sur les Poissons Fossils D'eusse-Drome. Clupea Fontannesi, n. sp. Par M. H. E. Sauvage. Roy. 8vo, pp. 6, 1 plate. Paris, 1881. From the author.

Di Nuovo sui lavori del geologico nelle Alpi Apuane. C. De Stefani. Estratto del processo verbale della Societá di Scienze Naturali Aduranga del di 13 Marzo, 1881. 8vo, pp. 8. 1881. From the author.

Anales del Museo Nacional de México. Tomo II. Entrega 4a. Sumario.

Códice Meneazino; Ensayo de descifracion georgifica. Por el Sr. D. Manuel Orozcay Berra. (Continuacion.)

La Piedra de Sol; Estudio argueologico. Por el Sr. D. Alfredo Chavero. (Continuacion.)

Geologio, Noticias geologicas de algunos Caminos Nacionales. Por el Sr. D. Mariano Bárcena.

Mitos di los nahoas. Por el Director del Museo.

Dos antiguos monumentos de arguitectura Mexicana. Illustrados por el P. Pedro Jose Márquez. Traducido pora los "Anales del Museo." Por F. P. T. 8vo, pp. 80, 3 plates. Mexico, 1881. From the director of the National Museum.

On the Structure and Development of the Skull in the Batrachia. Part III. By William Kitchen Parker, F.R.S. 4to, pp. 268, 44 plates, colored, and cuts. From the Philosophical Transactions of the Royal Socicty, Part I, 1881. London, 1881. From the author.

A Blastoid found in the Devonian Rocks of Ontario. By Henry Montgomery. 8vo, pp. 4, cuts. Extract from the Canadian Naturalist, Vol. x, No. 2. Montreal, 1881. From the author.

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GENERAL NOTES.

BOTANY.[1]

CARUEL'S NEW SYSTEM OF PLANTS.—In the last number of his *Giornale Botanico Italiano*, Caruel proposes a system of plants which contains so many interesting points that it will be profitable to reproduce it here in a condensed form. He recognizes five grand divisions, viz: Gymnogamæ, Bryogamæ, Schistogamæ,

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[1] Edited by PROF. C. E. BESSEY, Ames, Iowa.

Prothallogamæ and Phanerogamæ. The first is equivalent to the Thallophyta of many German botanists, but is treated very differently by the author. The Myxomycetes are very properly placed at the lower end of the division, in a separate class, the Plasmodieæ. In accordance with the rapidly growing idea first brought out by Cohn, the chlorophyll-bearing and chlorophyll free plants are not separated as Algæ and Fungi; and the lichens are considered an order constituting with the Sphærideæ and Gymnoascideæ the cohort Angiosporatæ, the latter very nearly equivalent to the Ascomycetes of botanists. The radical error, as it appears to us, in Caruel's disposition of the plants of the class Thallodeæ consists in making use of the asexual reproductive bodies in characterizing the sub-classes. Conidia and zoöspores at least, and almost certainly the tetraspores also (chains of four conidia?), are homologues, whose differences are related to differences in the habitat of the plants producing them. Conidia (if we except tetraspores) are aerial, while proper zoöspores are aquatic.

The position assigned to the Characeæ is scarcely a tenable one. They are too nearly related to the Floridiæ, and too distantly to the ferns to warrant placing them between the Bryogamæ and Prothallogamæ.

The separation of the Phanerogamæ into three classes will strike every one as an innovation of doubtful value. Why the orthography of Gymnospermæ should be changed to Gynospermæ, is also to be questioned. It will be observed that the cohorts and orders of the Angiospermæ rank higher respectively than do the groups bearing these names in the system most in vogue in this country: the families (omitted for want of space) in Caruel's system, are almost the equivalents of the orders of Bentham and Hooker, while Caruel's orders are nearly equivalent to Bentham and Hooker's cohorts.

Division GYMNOGAMÆ.

Class PLASMODIEÆ.

Cohort *Plasmodiatæ.*

Order Myxomycetes; Fam. Ceratiaceæ, Trichiaceæ.

Class THALLODEÆ.

Sub-class SCHIZOSPOROPHORÆ.

Cohort *Schizosporatæ.*

Order Nostochideæ; Fam. Chroococcaceæ, Oscillariaceæ, Nostocaceæ, Rivulariaceæ, Scytonemaceæ.

Sub-class CONIDIOPHORÆ.

Cohort *Gymnosporatæ.*

Order Puccinideæ; Fam. Sporotrichaceæ, Fusariaceæ, Stilbaceæ, Trichodermaceæ, Ustilaginaceæ, Pucciniaceæ.

Order Agaricideæ; Fam. Exobasidiaceæ, Tremellaceæ, Agaricaceæ, Lycoperdonaceæ.

Cohort *Angiosporatæ.*

Order Gymnoascideæ; Fam. Gymnoascaceæ.

Order Sphærideæ; Fam. Helvellaceæ, Sphæriaceæ, Erysiphaceæ, Tuberaceæ.

Order Lichenideæ; Fam. Myriangiaceæ, Verrucariaceæ, Parmeliaceæ.

Sub-class ZOOSPOROPHORÆ.

Cohort *Euzoosporatæ.*

Order Ulvideæ; Fam. Cladophoraceæ, Ulvaceæ, Sphacelariaceæ, Sporochnaceæ.

Cohort *Zygosporatæ.*

Order Pandorinideæ; Fam. Botrydiaceæ, Pandorinaceæ, Ulotrichaceæ.

Order Zygnemideæ; Fam. Diatomaceæ, Desmidiaceæ, Zygnemaceæ.

Order Peronosporideæ; Fam. Mucoraceæ, Chytridiaceæ, Peronosporaceæ, Saprolegniaceæ.

Cohort *Oosporatæ.*

Order Vaucherideæ; Fam. Monoblepharidaceæ, Volvocaceæ, Vaucheriaceæ, Sphæropleaceæ, Œdogoniaceæ, Coleochætaceæ.

Order Fucideæ; Fam. Ectocarpaceæ, Fucaceæ.

Sub-class TETRASPOROPHORÆ.

Cohort *Tetrasporatæ.*

Order Pseudofloridеæ; Fam. Porphyraceæ, Dictyotaceæ.

Order Florideæ; Fam. Ceramiaceæ, Nemaliaceæ, Lemaneaceæ, Sphærococcaceæ, Melobesiaceæ, Rhodomelaceæ.

Division BRYOGAMÆ.

Class MUSCINEÆ.

Cohort *Muscineæ.*

Order Hepaticæ; Fam. Anthocerotaceæ, Ricciaceæ, Targioniaceæ, Monocleaceæ, Marchantiaceæ, Jungermanniaceæ.

Order Musci; Fam. Andreæaceæ, Phascaceæ, Sphagnaceæ, Bryaceæ.

Division SCHISTOGAMÆ.

Class PUTERÆ.

Cohort *Puteræ.*

Order Puteræ; Fam. Characeæ.

Division PROTHALLOGAMÆ.

Class ISOSPOREÆ.

Cohort *Isosporeæ.*

Order Filicariæ; (1) Sub-order Trichosporangiæ; Fam. Hymenophyllaceæ, Polypodiaceæ, Gleicheniaceæ, Osmundaceæ.

(2) Sub-order Phyllosporangiæ; Fam. Marattiaceæ.

(3) Sub-order Ophiosporangiæ: Fam. Ophioglossaceæ.

Order Calamariæ; Fam. Equisetaceæ.

Order Conariæ; Fam. Lycopodiaceæ.

Class HETEROSPOREÆ.

Cohort *Heterosporeæ.*

Order Phyllocarpariæ; Fam. Selaginaceæ, Isoetaceæ.

Order Rhizocarpariæ; Fam. Salviniaceæ, Marsiliaceæ.

Division PHANEROGAMÆ.

Class GYNOSPERMÆ.

Cohort *Coniferæ.*

Order Strobilifloræ; Fam. Cycadaceæ, Pinaceæ, Taxaceæ, Gnetaceæ.

Order Conifloræ; Fam. Welwitschiaceæ.

Class ANTHOSPERMÆ.

Cohort *Dendroicæ.*

Order Spermifloræ; Fam. Viscaceæ, Loranthaceæ.

Class ANGIOSPERMÆ.
Sub-class DICOTYLEDONES.
Cohort *Dimorphanthæ.*
Orders Julifloræ, Globifloræ, Clavifloræ, Urticifloræ, Euphorbifloræ, Begonifloræ.
Cohort *Monochlamydanthæ.*
Orders Nudifloræ, Involucrifloræ, Ranifloræ, Cactifloræ, Cytinifloræ, Daphnifloræ.
Cohort *Dichlamydanthæ.*
Orders Cirrifloræ, Myrtifloræ, Lythrifloræ, Rosifloræ, Tiliifloræ, Crucifloræ, Rutifloræ, Ericifloræ, Primulifloræ, Celastrifloræ, Umbellifloræ, Oleifloræ, Campanifloræ, Asterifloræ, Corollifloræ.
Sub-class MONOCOTYLEDONES.
Cohort *Centranthæ.*
Order Centrifloræ.
Cohort *Hydranthæ.*
Orders Fluviifloræ, Alismifloræ.
Cohort *Lirianthæ.*
Orders Glumifloræ, Spadicifloræ, Liliifloræ, Labellifloræ.

INFLUENCE OF SEVERE WINTERS ON VEGETATION.—The Botanical Society of France had its annual gathering at Fontainebleau this year, in the end of June. Among other matters that came up for study (we learn from *Revue des Deux Mondes*) was the modification of the flora of that district in recent times. A number of species have disappeared, chiefly by reason of severe winters. The winters of 1564, 1709, 1788 and 1879–80 were disastrous. Recent meteorology has proved that elevated places generally suffer less from cold than those of low position. The trees on low ground at Fontainebleau have suffered peculiarly. Cereals have suffered more on high ground, because snow is their best defence against frost, and on exposed points it is more driven about by wind. Many herbaceous plants, too, have been protected by snow, but several which grew on walls or the face of rocks have succumbed. Evergreens have suffered more than others, and the general destruction of the maritime pine in the central parts of France (in Champagne, Garthe, Rambouillet, as well as at Fontainebleau, it has perished), is a grave loss to the country. Among other plants which have been frozen out, or nearly so, in the center of France, are the broom heather, holly, ivy and box. Among species with caducous leaves, the elder, and even the oak, have seriously suffered; and the loss of chestnuts and walnuts, which used to be largely cultivated in the valley of the Loir and in Touraine, have thrown idle for a long time the oil-mills of that part of France. The Fontainebleau flora has been enriched, in recent times, with various new species, as well as impoverished by disappearance of old ones.—*English Mechanic.*

BOTANICAL NOTES.—Professor Goodale, of Harvard University, sails for Germany soon, to remain a year.——Dr. Gray intends to return from his sojourn in Europe early in the autumn.——The Cincinnati meeting of the American Association for the Advancement of Science did not yield much in the way of botanical papers. A half dozen papers, some scarcely passable, constituted the whole contribution from the botanists of the Association. What are our botanists doing? Doubtless they are busy; but it is not creditable to American science that so few papers were presented by them, especially when we bear in mind the length of the list of American botanists. A movement is under way to make a better showing in botany at the Montreal meeting.——One of the best botanical papers presented at Cincinnati was by Dr. Beal on the "Movements of Roots in germinating Indian Corn." Darwin's statement that "in whatever direction the primary radicle first protrudes from the seed, geotropism guides it perpendicularly downwards," was shown to require modification. Over four hundred kernels of sprouted Indian corn were placed over a large pan of water and set in the dark. No gummed papers were placed on the radicle-tips of these, yet they took many different directions. In all the lots, one coil or more was a very common thing; some coiling over and some under. Many went downwards, some in nearly a horizontal position, several directly upward where two of them made three coils each. No roots were tested in soil. An abstract cannot do this paper justice, since it was much condensed as it was presented. The results were quite remarkable. At another time some seeds were sprouted over water in the dark. Small pieces of gum paper placed a trifle one side of the tip, usually caused the root to bend away to a marked degree, sometimes only a trifle, and sometimes it produced no effect.——Professor Penhallow's paper on the "Phenomena of Growth in Plants," dealt with the movements of the stem and tendrils of the Mammoth squash.——Professor Meehan contributed "Additional facts on the Fertilization of Yucca." By artificial self-fertilization of pistils of *Yucca angustifolia*, fruit was obtained, although the pollen was applied to the *external* lobes of the stigma.——The August number of the *American Monthly Microscopical Journal* contains half a dozen formulæ for preservative media for use in mounting microscopical preparations of vegetable tissues.——Rand, McNally & Co., of Chicago, have just issued "The American Encyclopædia of Agriculture," by Jonathan Periam. An examination of the botanical part of the work shows that unusual care has been taken in its preparation.

ZOÖLOGY.

RECENT ZOOLOGICAL WORK IN FRANCE.—Among the most important zoölogical memoirs published in France, are those to be found in Lacaze-Duthier's Archives de Zoologie expérimentale et générale. The eighth volume, for 1879-'80, contains an elaborate essay, with most excellent plates, some of them printed on stone in colors, by L. C. Cosmorici, on the anatomy of the